

**DOCUMENT REVIEW: DRAFT TECHNICAL MEMORANDUM NUMBER 7, ADDENDUM TO FINAL
PHASE II RESOURCE CONSERVATION AND RECOVERY ACT FACILITY
INVESTIGATION/REMEDIAL INVESTIGATION WORK PLAN, SURFACE SOIL SAMPLING AND
ANALYSIS PLAN, ROCKY FLATS PLANT 903 PAD, MOUND, AND EAST TRENCHES
(OPERABLE UNIT 2)**

GENERAL COMMENT

The objective for sampling strategy (i.e., to obtain data to estimate the 95 percent upper confidence limit (UCL) on the mean concentration for risk assessment) is conceptually flawed. The objective of sampling should be to characterize the nature and extent of contamination. The decision to average the concentration for risk assessment over the sampled area depends on the spatial distribution of the data and the decision the risk assessment is meant to support. For example, if the question is whether or not to reembody a specific Individual Hazardous Substance Site (IHSS), it would be useless to assess risk based on average concentrations across the 1-square mile area proposed to be sampled in this plan.

SPECIFIC COMMENTS

1. Section 1.1, page (p.) 1-1, first and second paragraphs: The purpose of this Addendum is to extend the surface soil sampling proposed in the Work Plan to include the analysis of all contaminants that are potentially present at Operable Unit (OU) 2. However, no supporting evidence is presented in this section. Please briefly present the evidence for the proposed additional sampling.
2. Table 1-1, p. 1-4 to p. 1-7: The disposal history of most of the IHSSs listed in this table only indicate the possibility of significant release of uranium and plutonium. The evidence presented for the presence of volatile organic compounds, semivolatile organic compound (SVOC)s, pesticides, and polychlorinated biphenyls (PCB)s in the surface environment is extremely tenuous and does not appear to justify the inclusion of these contaminant classes in the sampling protocol. Please clarify.
3. Section 1.2.1.2: The section is devoted to the description of the nature and extent of contamination based on the existing data. Although the document asserts that many organic compounds are contaminants in the area, the spatial distribution of their concentrations over the area is not clear. It is suggested that maps be used to summarize the findings of previous investigations, and a discussion on the possible source(s) of the identified contaminants be added in the text. The map(s) and the discussion are necessary in order to justify the extra sampling proposed in this memorandum.

4. Section 1.2.1.4, p. 1-17, second paragraph: This paragraph states that the proposed surficial soil sampling will be a representative, uniform, random sampling. However, this statement seems a contradiction in terms and has not been supported by a valid sampling design. Please provide the rationale for the sampling strategy and define the terms "representative" and "uniform" used in this paragraph.
5. Section 1.2.2.2, p. 1-20, Table 1-2: Minor detection of SVOCs, pesticides, and PCBs in sediments or boreholes is not sufficient justification for extensive surface soil sampling for these compounds. Please expand on such matters as the nature and extent of their occurrences.
6. Section 1.2.2.2, p. 1-22, first paragraph: Please present an expanded justification for sampling for the specific radionuclides listed in this paragraph as well as for gross alpha and beta. Minor detection of specific radionuclides elsewhere at OU 2 is not sufficient to justify extensive surface soil sampling.
7. Section 1.2.2.3, p. 1-28, first paragraph: The discussions of Level IV and Level III data quality may be misleading. Level III data are obtained using the same quality assurance/quality control procedures as Level IV data. Contract Laboratory Program (CLP) methods are often used to obtain Level III data. If CLP methods are used, the only difference between Level III and Level IV data is that the laboratory provides a more detailed data package with the Level IV data, and the data validation process for Level IV data is more rigorous (see also the next comment). Please clarify the descriptions of Level III and Level IV data.
8. Section 1.2.2.3, p. 1-28, second paragraph: The statement that only Level V and Level IV data can be validated is incorrect. Data are not considered Level III data until they are validated. As discussed above, if CLP analytical methods are used, Level III and Level IV analytical results are the same. What determines the data quality level is the level at which the data are validated - Level III or Level IV. Validation at Level III is sufficient for risk assessment. Validation at Level IV requires more deliverables from the laboratory (e.g. raw chromatograms) and a detailed review of the additional data during validation. Level IV validation takes twice as long as Level III validation (several hours per sample) and unnecessarily increases project costs. Recommend that data quality of Level III is sufficient.
9. Section 2.2.1, p. 2-2, third paragraph: The objective for sampling (i.e., to obtain data to estimate the 95 percent UCL on the mean concentration for risk assessment) is conceptually flawed. (Please see General Comment above.)

10. Section 2.2.2, p. 2-6, third and fourth paragraphs: Please justify the statement that a sample population of 40, (i.e., 6 samples in the IHSSs and 34 samples in the square mile east of the source areas), will be adequate to assess contaminant distributions across OU 2. It is questionable if 6 samples are adequate to characterize the IHSSs sufficiently for the Feasibility Study (FS). The 34 remaining samples are on a grid on 1200 foot centers, i.e. a single sample will represent approximately 33 acres. Please explain further why this sampling arrangement is considered adequate.
11. Section 2.2.2, p. 2-6, fifth paragraph: It is unclear why mixing the biased and grid sampling approaches will satisfy either risk assessment requirements or FS requirements as stated here. For example, averaging concentrations over the entire area sampled, even with biased samples included, is likely to badly underestimate concentrations in the IHSSs which will be the focus of the FS.
12. Section 2.2.2, p. 2-8, first paragraph, last sentence: Again, the conclusion that the proposed sampling scheme provides for a systematic and conservative characterization of potential surface soil contamination has not been justified. Specific Comments 10 and 11 apply here as well.
13. Section 2.2.3, p. 2-8, fourth paragraph: It is stated that the background sampling method used for OU 1 is also applicable to OU 2. Both the location and the method needs to be justified in this document for two reasons: first, the statistical treatment of background data from the Rock Creek is unclear as presented in OU 1 Phase III Resource Conservation and Recovery Act Facility Investigation/Remedial Investigation (RFI/RI) Report; second, the "background samples" collected in Rock Creek for OU 1 failed to prove the samples are adequate to serve as background, especially for radionuclides.
14. Section 2.3.2 and 2.3.3, p. 2-10, last paragraph to p. 2-14, third paragraph: Please justify based on existing chromium contamination the need for the chromium analysis proposed. Also, please provide the rationales for analyses of 30 percent of the OU 2 and background samples for specific conductance, pH, and total organic carbon, 20 percent of the OU 2 and background samples for bulk density testing.
15. Section 3.1, p. 3-1, third paragraph: Laboratory blanks and laboratory replicates are not collected in the field. The laboratory blanks and replicates are derived from the outside laboratory and are a part of their internal control. Please correct the second sentence.

16. Section 3.1, Table 3-1: Footnote number 1 indicates a misunderstanding of the nature and purpose of field blanks. Field blanks (also called source blanks) are samples from water sources used in decontamination procedures. They are taken to assure that source water is not introducing contamination into environmental samples. It would appear that field blanks would be required for this investigation. Please review this issue. (Note: The OU 1 RFI/RI report claimed a potential problem with the water used for decontamination. Had field blanks been collected, this question could have been resolved or the problem recognized earlier in the sampling program.)

Field duplicates are usually taken at a frequency of 1 in 10 rather than 1 in 20 as specified here. Please confirm that the frequency specified here is consistent with Environmental Protection Agency requirements.

It is also necessary to collect samples for matrix spike and matrix spike duplicate (MS/MSD) analyses, usually at a frequency of 1 in 20. It would appear that MS/MSD samples should be added to the table.

17. Section 3.1, p. 3-3, Table 3-2A: Please see specific comment 16 on Table 3-1.
18. Section 3.1, p. 3-4, Table 3-2B: Please see specific comment 16 on Table 3-1.
19. Section 3.1, p. 3-5, first paragraph: MS/MSD samples are not laboratory samples but are collected in the field. Please review specific comment 16 on Table 3-1.
20. Section 3.2, p. 3-5, fifth paragraph: The expression of accuracy is incorrect. The correct expression should be:

$$(A_r - A_o)/A_r \times 100 \text{ percent.}$$

21. Section 3.4, p. 3-9, second paragraph: The formula for relative percent difference (%RPD) is incorrect. The correct expression is:

$$\%RPD = 2 \times ((C_1 - C_2)/(C_1 + C_2)) \times 100 \text{ percent}$$

22. Section 3.4, p. 3-9, third paragraph: %RSD usually stands for Relative Standard Deviation instead of "percent relative deviation" used in the text. The text correctly stated that %RSD is the standard deviation relative to the mean of the sample. However, neither the standard deviation nor the mean is expressed correctly in the formula. Please correct the formula.